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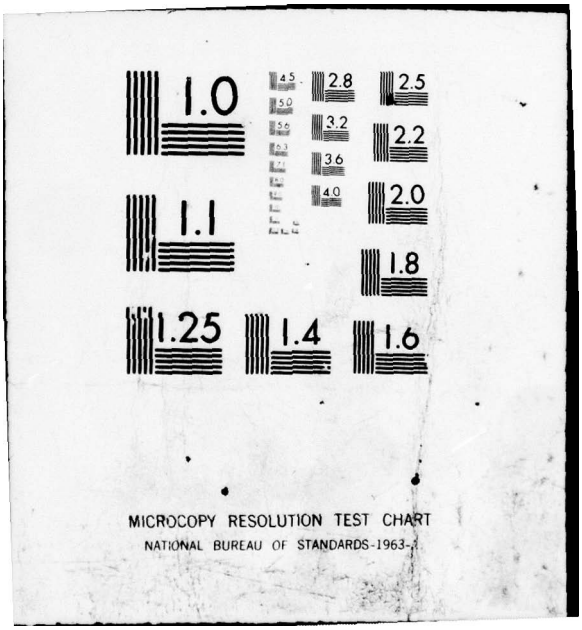
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THE UNIVERSITY OF AKRON

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Organizational Policy Decisions As A Function of Task Design and Individual Abilities, Preferences and Orientations

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The research has involved the development and validation of a Congruence Model of job design which allows for the prediction of productivity, work satisfaction, and tenure. The Congruence Model is based on an assumption that task, workers and organizational factors interact in a work situation. The model incorporates the variables of information processing abilities, preferred job features (such as variety), individual expectations concerning the task (the job will have variety), described task characteristics (the-

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job has variety) and objective measures of the complexity of the task (such as number of decisions to be made). The Congruence Model has been supported in a series of field studies involving naval and civilian personnel and laboratory studies which have simulated monitoring tasks and maintenance tasks. Results from a series of studies have pointed to the key role of information processing abilities in influencing preferences for certain job attributes and in determining performance, and job satisfaction outcomes.

In general, individuals with higher levels of ability expressed preferences for jobs which include more variety. Specific information processing abilities have been identified which relate positively to job performance in monitoring tasks but negatively to job satisfaction so that individuals with the most task-related ability derive the least satisfaction from performing a monitoring task.

The research project has developed computerized measures of information processing ability (e.g., short term memory, visual search) and computerized measures of task preferences and descriptions (e.g., response pace, stimulus variety and response variety). The major research finding is that computerized measures of information processing ability relate to monitoring performance. In addition, computerized measures of information processing preferences relate to task satisfaction.

This leads us to conclude that organizations can identify and specify the relationships among the variables in the Congruence Model and can make selection and job design policy decisions which will lead to more desirable outcomes for the organization and the individual.

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SECTION I

Introduction

Job Design

The field of job and task design has spawned at least ten different conceptual approaches (Barrett, Dambrot, & Smith, 1977). In the early 1800's, task design was mainly concerned with how much physical work a man could perform in a stated period of time. Work output was often compared to that of a horse, and physical demands were considered to be the most important factors in job design. From that early beginning to the present time, conceptualizations of job design have evolved through job simplification (Gilbreth, 1911; Taylor, 1911), the physiological and psychological demands of the task (Herzberg, 1966, 1968; Walker & Guest, 1952), physiological mechanisms of cognitive activation (Murrell, 1967, 1969, Scott, 1966), the role of group and cultural differences (Blood & Hulin, 1967; Turner & Lawrence, 1965) and socio-technical approaches (Cooper & Foster, 1971; Davis, 1966, 1970, 1971).

Recent developments such a those advocated by Huse and Beer (1971) and Walton (1972), are examples of combining job design with concepts of organizational development. This view would tend to see job design as one component of a broader organizational development program. Hackman and Lawler (1971) developed an expectancy theory approach to job design and enrichment which included the concept of higher order need strength. Recently, this conceptualization has been expanded by Hackman, Oldham, Janson, and Purdy (1975). Their basic theoretical model postulates five core job dimensions of skill variety, task identity, task significance, autonomy, and feedback. Jobs high in those core dimensions will lead to critical psychological states which in turn result in certain personal and work outcomes. These include high quality work performance, high satisfaction with the work, and low absenteeism and turnover. The complete model is moderated by higher order need strength,

as only workers who value accomplishment and growth will respond favorably to jobs high on the five core dimensions.

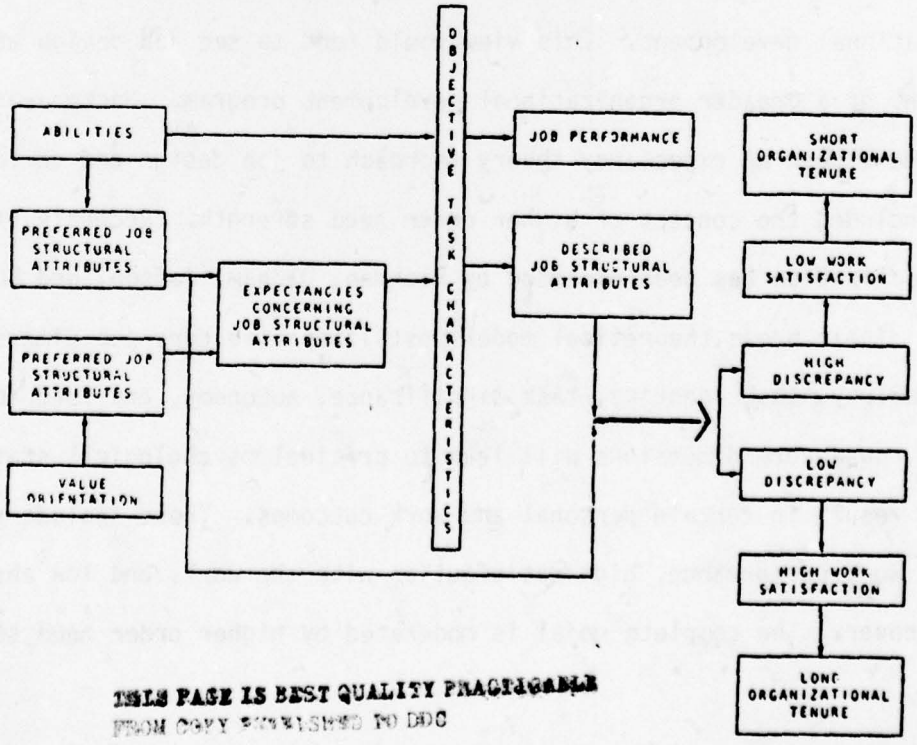
This report summarizes the theoretical development and supporting empirical base of a congruence model approach to job design. The program of research began with the successful prediction of a variety of job outcomes (satisfaction and performance) from general paper-and-pencil measures of abilities, preferences and selected personality characteristics. The work progressed through the development of standardized computer-based information processing measures of specific abilities and computer-based task attribute preferences and descriptions.

Overview of Congruence Model

The research project has involved the development and validation of a congruence model approach to job design (Barrett, 1978). An overview of the model is provided in Figure 1.

Figure 1

AN OVERVIEW OF CONGRUENCE MODEL



This model postulates that there is an optimal match or congruence among abilities, preferred attributes, expectancies, and task complexity which will result in maximization of resources in terms of individual productivity, work satisfaction, and organizational tenure.

Both individual ability level and values influence preferred job structural attributes. Before entering a job the individual has some expectancies concerning such attributes. These expectancies and preferred job structural attributes will interact with the actual work experience to influence the description of job structural attributes. The discrepancy between the described and preferred job structural attributes will be the main determinant of work satisfaction, while the individual ability level will be the main determinant of job performance. This is consistent with other reviews and research indicating that motivational variables add little to ability measures when predicting job performance (Barrett, Alexander, & Rush, 1977; Dunnette, 1973; Rush, 1978).

A comparison of Hackman's conceptualization with this congruence model illustrates the similarities and differences in the two conceptual approaches. First, the Hackman approach postulates a set of core attributes common to all jobs. In contrast, the congruence model suggests a more idiographic approach. That is the attributes which are important for any task are often unique to it. For example, in field and laboratory studies involving both maintenance and monitoring-type tasks, it was found that the attribute of learning new skills was an extremely important dimension for maintenance tasks, but not for monitoring tasks (Barrett, Bass, O'Connor, Alexander, Forbes and Cascio, 1975). The evidence from these investigations indicates that each job may have one or more unique attributes which are particularly salient to the individual performing the task. Therefore, it is necessary to determine what set of attributes is the most important for the specific task being performed.

This does not imply that there are no common attributes among tasks, but that the set of these attributes will likely be somewhat different for each position.

Second, the congruence model states that it is important to measure both individual job attribute preferences and the description of the task attribute. A discrepancy score can then be computed between the preferred and described job attributes. This discrepancy measure has been found to be particularly important in explaining varying degrees of job satisfaction.

Third, the congruence model is based upon empirical evidence which indicates that individual abilities are often the single most important factor in determining not only job performance, but the satisfaction the individual receives from performing the task. This conceptualization is in sharp contrast to the other theoretical approaches which have been discussed. None of these other approaches specifically acknowledge or include the role of individual abilities as a major factor, particularly with respect to satisfaction.

Fourth, the congruence model is based upon the proposition that individual ability levels will be related to, and will largely determine, some job attribute preferences, while value orientations will relate to other job attribute preferences. This is in contrast to other approaches to job design which assume that growth need strength is the most important variable in determining the influence the core attributes have on work performance and satisfaction.

Fifth, individual expectancies concerning job structural attributes before performing the task will influence subsequent perception of these attributes. The expectations will moderate the relationship between ability and outcome variables. Each of these propositions of the congruence model will be examined in terms of supporting evidence from recent field and laboratory studies.

Taxonomy of Organizational Types

This congruence model was derived in part from a taxonomy of organizational types classified according to the relationship between an organization's selection system and performance and satisfaction outcomes. Figure 2 presents the nine possible types of organizations.

Figure 2

A Taxonomy of Organizational Types Based On the Relationship Between the Selection System of the Organization and Performance and Satisfaction Outcomes

Organizational Type	Selection System Correlation with Outcomes: Performance	Satisfaction
1	+	+
2	+	-
3	+	0
4	-	-
5	-	+
6	-	0
7	0	+
8	0	-
9	0	0

+ = Positive relationship between selection system and outcome.

- = Negative (inverse) relationship between selection system and outcome.

0 = No relationship between selection system and outcome.

While this is a simple taxonomy, it is inclusive in representing the possible states of the world. There is evidence that each type does exist in the real world even though some of the organizational types would appear to be quite dysfunctional. Organizational Type 1 indicates that the organizational system selects individuals based on their probability of success in the organization. In addition, this same organizational selection system is positively related to individual satisfaction. In effect, Type 1 organizations are selecting those individuals who not only have the best probability of success, but who will also gain the most satisfaction from the job itself, and therefore, will have the highest probability of remaining with the organization.

Many organizations can be classified as Type 2, in which the selection system relates to job performance, but the same tests which predict performance show a negative relationship with job satisfaction (Barrett, Forbes, O'Connor, & Alexander, in press). In effect, these organizations are selecting those individuals with the highest probability of performing well on the job, but at the same time, will derive less satisfaction from the job itself than those individuals who would have a lower probability of performing adequately. Perhaps the best example of this is the organization that selects individuals who are overqualified for the position. This phenomenon was researched over 50 years ago by Bills (1923) and has been studied by others including Kriedt and Gadel (1953), Viteles (1932), Wyatt, Fraser, and Stock (1929), and Wasson (1971).

While it is not necessary to review the other types of organizations in detail, it should be noted that other organizational theorists typically assume that organizations are Type 1 in character. Organizations do exist which are Type 4, even though the decision makers in the organization may not be aware that they are selecting individuals with the least probability of performing

well and gaining the least satisfaction from the job itself. This taxonomy provides a framework for the congruence approach to realistic organizational concerns such as job design, selection training, job previews, and placement.

SECTION II

Abilities

Although it is clear that abilities are principle determinants of job performance (Dunnette 1973), they have been largely ignored in job design research concerned with worker satisfaction or motivation. For example, there is consistent evidence that intelligence is related to turnover in simple jobs (Behling & Schriesheim, 1976), although intelligence has not been consistently related to more subjective measures such as feelings of monotony and boredom (Smith, 1955).

In addition, previous research has successfully identified several information processing abilities that are predictive of monitoring/vigilance performance (Fleishman, 1975). Research completed under this present and a previous contract (Barrett, Forbes, Alexander, O'Connor and Balascoe, 1975; Barrett, O'Connor, Alexander, Forbes and Balascoe, 1975; Forbes, Barrett, Alexander and Phillips, 1976; O'Connor, Barrett, and Alexander, 1977) has pointed to the role of information processing ability in predicting performance.

The program of research under this and a previous contract began with the use of global, general paper-and-pencil measures of ability and it was found that with certain of the measures it was possible to predict both performance and satisfaction for a variety of both laboratory and real world monitoring, maintenance, clerical and sales jobs. The research then proceeded to the refinement of ability measures for the express purpose of eliminating contextual and individual contaminates, finally arriving at a set of computerized measures of information processing ability which were keyed to detailed analyses of the components of real tasks.

Measurement

An important aspect of the congruence model is that the abilities required by a job must be possessed by the people on the job if they are to be effective performers. Any adequate test of the congruence model requires as close a match as possible between the required job abilities and the abilities measured by the test battery.

Past research (Barrett, Forbes, Alexander, O'Connor, & Balascoe, 1975; Barrett, O'Connor, Alexander, Forbes, & Balascoe, 1975; Forbes, Barrett, Alexander, & Phillips, 1976; O'Connor, Barrett, & Alexander, 1977) has predicted some components of success in monitoring and maintenance tasks using tests that measure associative memory (Picture-Number Test), (Ekstrom, French, & Harman, 1976) perceptual style (Rod and Frame Test; Witkin, Lewis, Hertzman, Machover, Meissner, & Wapner, 1954), and selective attention (Selective Attention Test; Mihal & Barrett, 1976). In addition, the perceptual style and selective attention tests have been predictive of success in other tasks requiring these skills, such as driving behavior (Mihal & Barrett, 1976). Therefore, there was good reason to believe that valid tests measuring specific information processing abilities could be devised and related to task performance.

There are two traditions in the psychological study of information processing: experimental and psychometric. Until recently, experimental research on information processing in humans has basically concentrated on normative issues, while the psychometric information processing tradition has mainly resulted from attempts to explore the structure of the intellect through factor analyses. The most ambitious attempt thus far in relating experimental information processing abilities with psychometric constructs has been by Hunt, Frost, and Lunneberg (1973) who looked at the relationships between ability on certain well established information processing tasks from experimental laboratories and verbal and quantitative abilities. While the results were not

conclusive, they were suggestive of relationships between speed of short-term memory processes and verbal ability and between resistance to interference in short-term memory and quantitative ability.

Although the Hunt et al. (1973) findings are interesting and suggestive, the study did contain shortcomings from the point of view of the present investigation. While they were attempting to demonstrate relationships between abilities and the information processing tasks, there was no attempt to systematically evaluate the usual psychometric characteristics (e.g., reliability) of the performance tasks. Also, there was no attempt to relate test scores to an external criterion. Each of these steps is necessary in developing measures that can be used for extensive scientific investigation or for application of the measures to selection.

One purpose of the program of research was to develop or improve tests of information processing ability and to relate these tests to performance on tasks believed to require those abilities. The tests were administered and scored by a PDP 11-10 minicomputer using a CRT graphics terminal for visual display. This gave an advantage over existing measures by providing standardized presentation, as well as very exact timing of both presentations and responses. In addition, the nature of the tests was such that dependence upon literacy and other educationally or culturally linked abilities was minimized. This ensured that the widest range of persons, could be validly and fairly tested solely on the abilities in question. Based on a review of the information processing literature a number of tests were developed. Examples of the developed measures follow:

1. Visual Memory: Array. In this task four 2.22 cm figures were presented on the screen for 2 sec and then erased. The figures consisted of a pound sign, arrow, roman numeral five, and an X. The subject was then presented with one

of four figures and was required to indicate the area of the screen in which the figure was previously presented. The subject had 3 sec in which to respond.

2. Visual Memory: Vectors. This task was identical to the above task with the exception that after presentation of the four figures the subject was presented with two figures and required to indicate in which area of the screen the two figures would meet if one of them moved in a horizontal and the other moved in a vertical direction. The subjects had 3 sec in which to respond.

3. Linear Scanning. Twenty equilateral triangles were presented in a line across the screen. The triangles measured 1.59 cm on a side. Each of the triangles had a line through it with the exception of one, two, three or four of the triangles. The string of triangles was presented for 1.5 sec and then erased at which time the subject was required to respond as to whether one, two, three, or four of the triangles did not have lines through them.

4. Matrix Scanning. Twenty equilateral triangles were presented in a 4 x 5 matrix arrangement. The triangles measured 1.59 cm on a side. Each of the triangles had a line through it with the exception of one, two, three, or four of the triangles. The matrix of triangles was presented for 1.5 sec and then erased at which time the subject was required to respond as to whether one, two, three or four of the triangles did not have lines through them.

5. Short Term Memory Search: Sequential. This measure consisted of from one to five 2.22 cm letters presented sequentially. Each letter was presented for 800 msec followed by 200 msec delay to be followed by the next letter. The last letter presented was followed by the probe letter after a period of 2 sec. The

subject responded indicating whether or not the probe letter was the same as any one of the memory set letters. Subjects had 3 sec to respond.

6. Short Term Memory Search: Simultaneous. This measure and the one above were presented in the same manner. In the simultaneous memory task a set of from one to five letters was presented for 3 sec simultaneously. Subjects were required to respond as to whether the probe letter matched any one of the memory set letters.

7. Visual Search. This measure consisted of the presentation of a 2.22 cm probe letter for 800 msec. After a duration of 2 sec, a set of from one to five 2.22 cm letters were presented simultaneously for 3 sec then erased. The subject responded whether the probe letter was the same or different from any one of the memory set letters.

8. Visual Selective Attention. Recently, Barrett, Alexander, and Forbes (1977) combined measures of information-processing ability into an integrated model to facilitate the understanding of underlying processes associated with task performance. The model was comprised of components of information-processing ability (e.g., selective attention, perceptual style, and reaction time). The course in the development of this model has been to identify or construct measures of information-processing that relate to other individual difference measures, as well as the task at hand. This emphasis was demonstrated in the previous research of Mihal and Barrett (1976) and Barrett, Mihal, Panek, Sterns, and Alexander (1977) and Panek, Barrett, Sterns and Alexander (1978). Combining different measures of information-processing into a test battery, they demonstrated a moderate relationship between divergent information-processing

measures, in addition to establishing a linkage between processing capacity for separate sensory modalities (i.e., vision versus hearing).

One important result noted above concerns the relationship in performance for different sensory modalities. Researchers have focused upon intersensory relationships in information-processing, specifically with vision and hearing. However, these research efforts have tended to place a greater emphasis on measures of auditory selective attention versus visual. This trend may be attributed to Broadbent (1958) and Von Wright (1968) who cautioned researchers against conducting investigations with vision due to the confounding nature of eye movement patterns. Consequently, very few measures of visual attention were developed.

A Visual Selective Attention Test was constructed to approximate a visual counterpart of the Auditory Selective Attention Test (Avolio, Alexander, Barrett, & Sterns, submitted). The test was presented to subjects through a Tektronix CRT screen Model No. 4010 linked to a PDP 11E10 computer. The characters appearing on the screen were numbers and letters. The size of the characters was 3 mm. The pairs of numbers and letters were presented in the center of the screen. Each of the characters making up the pairs were presented 7.5mm on either side of the center point of the screen. The major differences between the auditory and visual measures of attention were in the requirements of the subjects and the pace of each test. With the auditory test, subjects attended to the left or right channel depending on the cue. Rather than split an individual's field of vision, which does not represent normal visual processing, we felt that having subjects respond to particular stimuli in both the left and right channel would allow for a more accurate assessment of actual visual processing.

Another difference was in the pace at which the stimuli were presented. With Auditory Selective Attention pace of presentation was constant across messages. With Visual Selective Attention the speed of presentation was systematically decreased across trials to evaluate the upper range of individual ability.

The test consists of 24 test messages consisting of two parts each. At the beginning of each message the message number was presented and then erased. After a 2.5 sec interval, the relevant cue word was presented for .5 sec. The cue words coffee and apple were chosen to correspond with the relevant cues of an alternative measure of auditory attention not reported here. The cue word coffee indicated that the subject should respond to all odd numbers in the left channel and even numbers in the right. The word apple indicated that even numbers in the left channel and odd in the right were to be reported. The instructional set forced the subject to attend to both channels, therefore approximating normal visual processing. Memory factors were eliminated by sufficient practice of the instructional set.

The cue words were presented on either side of the midpoint of the screen to control for a position effect. Following the erasure of the cue word there was a 2 sec interval before part one of the message was presented. Part 1 consisted of 16 pairs, each pair consisting of either an English letter and a number, two English letters, or two numbers. The numbers ranged from 0-9 with the exclusion of the number 8 due to its similarity with the letter B.

Following the erasure of the last pair of part 1, there was a 2 sec interval before the presentation of the cue word for part 2 of the message. After the cue word was erased there was a 2 sec interval before the presentation of the second set of pairs.

The second part of each message always contained pairs of digits. These pairs were preceded by either zero, one, or two additional pairs of letters. Following the completion of Part 2 there was a 5 sec interval before the presentation of Message Number 2, which allowed the subjects to prepare for the next message.

The format of the test called for an decrease of 50 msec in the presentation of each pair following every third message. Consequently, each pair in the first three messages was displayed on the screen for 400 msec; the next three messages presented each pair at a rate of 350 msec per pair. Following this pattern across the 24 messages, the last three messages presented each pair for a period of 50 msec. All other specifications for the Visual Selective Attention Test were set as close as possible to those used by the Auditory Selective Attention Test. Scoring was also based upon the same procedure used in the auditory test (i.e., omission and intrusion errors).

9. Selective Attention: Digits. In this task, three digits are presented on the screen for 3 sec. The subject responds in one way if: (1) the first number is the largest and the second is the smallest, or (2) the third number of the set is the largest and the first is the smallest. The subject gives an alternate response when neither of these conditions is present. There is one practice set of 12 trials, then two scored sets of 12 trials each. There is a 2 sec delay between trials.

10. Selective Attention: Letters. This test is identical to the above list except that letters are used rather than digits. If a vowel follows a consonant or two vowels or consonents occur together, the subject gives one response. If a consonant follows a vowel, the subject gives an alternate response. Trials

are spaced 2 sec apart. There is one practice set of 14 trials, then two scored sets of 14 trials each.

Ability and Satisfaction

The role of abilities in relation to job satisfaction has been largely ignored in previous conceptualizations. A consistent finding of both field and laboratory studies is that individuals with the most task related ability derive the least satisfaction from the task if the task is low in job structural attributes. In a field study of Navy personnel it was found that an aptitude test battery designed to tap high complexity monitoring type performance was negatively related to satisfaction and intended future Naval service (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975; Barrett, Forbes, O'Connor, & Alexander, 1980). In a laboratory simulation involving monitoring tasks ability was found to be strongly related to performance and negatively related to satisfaction on a very simple task while an inverted U-shaped relationship was found on a more complex task. Moderate ability subjects were most satisfied (Barrett, Forbes, O'Connor, Alexander, 1980; Forbes & Barrett, 1978).

Research on laboratory simulation of maintenance type tasks has found that satisfaction moderated the relationship between ability and performance. Ability was more strongly related to task performance among those with high versus low levels of work satisfaction (Forbes, O'Connor, & Barrett, submitted; O'Connor & Barrett, 1980; O'Connor, Barrett, & Alexander, 1977).

The research results indicate that ability is an important moderator of the response to a task and that satisfaction is likely to be maximized when individual abilities match the requirements of the task.

Ability and Performance

Forbes and Barrett (1978) found that paper and pencil tests of information processing differentially related to two monitoring tasks which differed in task demands. The Group Embedded Figures Test (a measure of perceptual style and flexibility of closure) predicted performance in the less demanding task whereas measures of perceptual style, general intelligence, selective attention and memory predicted performance in the more demanding task. This differential pattern of results for similar tasks points out the critical importance of assessing the level of task demands in selection settings as well as laboratory research.

A laboratory study investigated the role of abilities in performing simulated maintenance tasks completed under two identical task conditions with psychologically manipulated experimental conditions of job structural attributes (O'Connor, Barrett and Alexander, 1977). Both general and specific mental ability were found to relate to task performance. Specifically general intelligence was found to be positively related to quantity of performance in both conditions while field independent individuals tended to produce the best quality in both conditions. Even though higher ability participants tended to produce at higher levels in terms of both quantity and quality, they were less satisfied (Organization Type 2).

Field studies have also pointed to the strong role of abilities in predicting performance. Barrett, Alexander and Rush (1977) studied 56 field sales representatives from a nationwide optical supply company. Ability measures consisted of a combination of the Wesman Personnel Classification Test, the Bennett Mechanical Comprehension Test, and a sales selection index which was derived from a linear combination of several aptitude and personality measures. The results provided support for the additive (rather than multiplicative) combination of ability and motivation measures in predicting job performance.

This set of results using ability measures are summarized in Table 1.

Table 1

Review of Studies

Ability-Performance-Satisfaction

Type of Task	Type of Study	Predictors	Criterion	Comments	References
Monitoring	Laboratory	General ability Flexibility of closure Selective attention Memory Perceptual style	Performance on simple and complex monitoring tasks	$R = .64$ $p < .001$ Complex monitoring task and ability measures. On simple task, ability positively related to performance and negatively related to satisfaction. On complex task inverted U found with moderate ability subjects most satisfied.	Barrett, Forbes, O'Connor, & Alexander, 1980; Forbes & Barrett, 1978; Forbes, Barrett, Alexander, & Phillips, 1976
Maintenance	Laboratory	General ability Flexibility of closure Perceptual style	Performance on simulated maintenance task	General ability, flexibility of closure and perceptual style were significantly related to performance in high expectation task-high satisfaction group.	Barrett, Forbes, O'Connor, & Alexander, 1980; O'Connor, Barrett, & Alexander, 1977

Table 1 (cont'd.)

Type of Task	Type of Study	Predictors	Criterion	Comments	References
Monitoring	Laboratory	Information processing measures: Visual memory Vectors Visual memory array Linear scanning	Complex monitoring performance	Number correct & Visual memory vectors = .46 Visual memory array = .65 Linear scanning = .27 False alarms & Visual memory vectors = -.63 Visual memory array = -.81 Linear scanning = -.47	Barrett, Alexander, Cellar, Doverspike, Thomas, Binning, & Kroeck (submitted)
Sales	Field	General ability Motivation Job tenure	Sales volume Supervisors rating Promotability Satisfaction	Additive combination of motivation and ability was superior to multiplicative combination in predicting performance	Barrett, Alexander, & Rush, 1977
Clerical	Field	Personality variable Job performance and descriptions	Satisfaction Supervisors ratings	Negative relationship extraversion and job satisfaction. Congruence between preferred and described job structural attributes related to job performance	Sterns, Alexander, Barrett, & Dambrot, (submitted)
Monitoring	Field	Naval test battery	Satisfaction Intended future Naval service	Individuals with most task related ability derived least satisfaction from task and have shortest intended Naval service.	Barrett, Forbes, O'Connor, Alexander (1980)

SECTION III

Task Preferences

Preferences for job structural attributes are conceptualized to be the preferred manner an individual chooses in processing information. Information processing preferences were conceptualized and found to be slightly related to ability measures much the same as the finding that ability measures are related to interest and personality measures.

There is some conceptual similarity between the information processing preference measures and "objective" personality tests as defined by Goldberg (1979). Objective personality tests are considered to have two important characteristics. First the scoring can be automated and second testees can deliberately distort their true scores only in the direction of faking poor performance but not good performance. The "information processing" preference measures developed during this research project meet the first standard and to some extent meet the second standard. The preference scores are presented and scored in a standardized fashion. The preference measures are structured in such a manner that what is "good" or "bad" will vary with the task or job to be predicted. What is not solved is the potential problem that some might believe a response in a certain direction is "good". For example, a testee might mistakenly believe that a better response on the pace preference task is one in which a very rapid response rate is chosen.

Paper and pencil measures of preferences were initially developed. Those were somewhat more susceptible to being influenced by cultural norms or social desirability since there are some individuals who might subscribe to the popular view that "preferring a job with more variety is more socially desirable than preferring a job with little variety." There is evidence that the computerized preference measures were influenced less by social desirability considerations

since responses covered the range of possible scores and were distributed throughout the potential scoring range.

Measurement

Our previous research on job structural attribute preferences has relied exclusively on two paper-and-pencil measures. These are the Work Itself/Work Environment Preference Questionnaire (WI/WE-P) and the Attribute Preference Scale (APS). The WI/WE involves a series of descriptive statements of the attributes followed by five statements of preference level for each attribute. The APS (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975) is a Q-sort technique in which individuals are asked to rank order a variety of statements concerning several job structural attributes.

Each of these instruments has been used in previous job design research (Barrett, Alexander, & Rush, 1977; Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975; Barrett, Dambrot, & Smith, 1977; Barrett, Forbes, Alexander, O'Connor, & Balascoe, 1975; Barrett, O'Connor, Alexander, Forbes, & Balascoe, 1975; Forbes, Barrett, Alexander, & Phillips, 1976; O'Connor, Barrett, & Alexander, 1977; Sterns, Alexander, Barrett, & Dambrot, submitted).

However, both of these questionnaires are susceptible to the typical biases often associated with paper-and-pencil tests in general, including response bias and social desirability. In addition, the construct validity of the attributes themselves is difficult to assess when only one specific methodology is employed in the research (Campbell & Fiske, 1959).

These considerations led to the development and evaluation of other measures of job structural attributes which might be less affected by such biases.

The computerized preference measures were controlled, and responses collected and scored using a PDP 11-10 minicomputer. The computer drives a

graphics display on a Textronix CRT screen. Following are examples of the measures developed.

Preference for Pace of Information Flow. This task was designed to assess the rate at which individuals chose to receive stimulus information. The task was constructed to represent a simple identification task. Subjects' performance on this task did not represent differences in ability since individuals rarely failed to identify correctly the target stimulus across trials. This task presents a series of boxes at varying speeds across a Tektronix CRT screen. The subject controls the speed of presentation through an 8 button response panel. The higher the number on the response panel the faster the boxes are displayed across the screen. The following are the different speeds of presentation from the onset of the first box to the offset of the last box in each trial: Speed 1, 7 sec; Speed 2, 6 sec; Speed 3, 5 sec; Speed 4, 4 sec; Speed 5, 3 sec; Speed 6, 2.5 sec; Speed 7, 2 sec; Speed 8, 1.5 sec. At the beginning of each trial a rectangular box (15 x 1 cm) is presented in the center of the CRT screen. After the subject presses a speed button, 11 boxes, presented one after the other, move across the rectangle.

The subject's task is to inspect each box as it appeared on the screen to determine whether an X appeared in any of the boxes. Once the display is completed the subject presses the "yes" button if an X is perceived. If the subject did not see an X in any of the boxes the "no" button is pressed. The overall preference measures for each subject is calculated by computing the average across a series of 20 trials.

Preference for Stimulus Variety. A grid with two rows and three columns appears on the screen for each trial. Each grid contains six symbols and the number of symbols which are different varies from trial to trial.

The subject is instructed to "consider the variety in each grid". Specifically, he/she is told to consider the grid with six different figures to

represent the highest possible degree of variety; the grid in which all the figures are the same as the least possible degree of variety; and the grids in between as intermediate degrees of variety.

When a grid appears on the screen the subject is instructed to respond whether the amount of variety represented in the grid is greater than or less than the amount of stimulus variety he would prefer on a job. The subject makes his reponse by pressing one of two buttons on the response panel. The one on the left is clearly identified as "Less than you prefer". The one on the right is clearly identified as "Greater than you prefer".

The subject makes only one response per trial. The grid remains on the screen for 5 sec and the subject may only respond while the grid is present. There is a total of forty-eight trials and each of the six levels of variety appears eight times.

A point of subjective equality (PSE) is estimated from the number of greater than and less than responses for each degree. The PSE represents the degree of stimulus variety which the subject prefers.

Preference for Repsonse Variety. A grid with three rows and two columns appears on the screen for each trial. Each grid contains six symbols and the number of symbols which are different varies from trial to trial.

The subject is instructed to decide whether the amount of variety represented in the grid is greater or less than the amount of response variety he would prefer on a job. The subject responds by pressing one of two buttons on the response panel.

The subject makes only one response per trial. The grid remains on the screen for 5 sec, and the subject may only respond while the grid is present. There are a total of forty-eight trials and each of the six degrees of variety appears eight times.

Again a point of subjective equality (PSE) is estimated. The PSE represents the degree of response variety which the subject prefers on a job.

Preferences, Abilities, Values, Individual Differences, and Expectations

The series of research studies using the paper and pencil preferences for job attributes of learning new skills, variety and job complexity found them to be related to ability while preference for responsibility was more closely related to intrinsic work orientations (Alexander, Balascoe, Barrett, O'Connor, & Forbes, 1975). In a laboratory simulation of maintenance type tasks, both general and specific mental ability were found to be related to preference for learning new skills while work values and reported agreement with the Protestant Ethic were related to preference for responsibility (O'Connor, Barrett, & Alexander, 1977). The age of the worker was also found to be related to job structural attribute preferences. In a study of 71 blue collar automotive employees it was found that younger employees were more concerned with variety, autonomy and the social opportunities offered by a job while older employees preferred higher levels of attention and responsibility, and showed a greater involvement with their jobs (Phillips, Barrett, & Rush, 1978).

In other research a basic personality dimension extraversion-introversion was related to job preferences. The sample included 175 Civil Service clerical employees. Extraverts were found to prefer higher levels of cognitive task demands including variety, attention, learning new skills and job complexity. In addition extraverts preferred higher levels of pace, cognitive closure and extrinsic and intrinsic rewards (Sterns, Alexander, Barrett & Dambrot, submitted). The study supported previous research which indicated that extraverts prefer more environmental stimulation in a variety of activities.

In a study of age differences it was found that older and younger workers did not differ in terms of performance on a monitoring task but older individuals preferred to work at a slower pace. It was also found that speed or preference for pace was significantly related to information processing ability (Panek, Barrett, Alexander, & Sterns, 1979). The results from these studies are summarized in Table 2.

The computerized preference measures would have the most utility for an organization if they would predict job satisfaction and tenure before the individual began work. Our first studies had predicted job satisfaction by computing the absolute differences between preferences and descriptions. The descriptions were obtained after the individual had performed the task. In the most recent investigations the average description of a representative group was used as the measure to subtract from each individual's initial preference measure. This would allow an organization to predict work satisfaction and tenure before an individual had any actual job experience. The initial results indicated that work satisfaction could be predicted using this technique.

Table 2

Review of Research on Job structural Attribute Preferences

Study	Measures of Job Structural Attributes	Major Finding	References
College Students N = 118	Work Itself/Work Environment (WI/WE) Attribute Preference Description Scale APS/ADS	Preference for learning new skills, variety and complexity related to ability. Preference for responsibility related to value orientations.	Alexander, Balascoe, Barrett, O'Connor, & Forbes, 1975
College Students Laboratory Simulation Maintenance Tasks	WI/WE APS/ADS	Ability related to preference for learning new skills. Work values and protestant ethic related to preference for responsibility.	O'Connor, Barrett, Alexander, 1977
Blue Collar Auto Workers	WI/WE	Younger workers concerned with variety, autonomy and social opportunities of job while older workers preferred higher levels of attention and responsibility showing greater job involvement.	Phillips, Barrett, & Rush, 1978
Civil Service Clerical Workers	WI/WE	Extraverts preferred higher levels of cognitive task demands, higher pace, cognitive closure and extrinsic-intrinsic rewards	Sterns, Alexander, Barrett, & Dambrot, (submitted)
College Students	Computerized preference measures	Preference for pace minimally related to information processing ability.	Avolio, Alexander, Barrett, & Sterns, 1979
Females ranging in age from 17-72	Computerized preference measures	Older females preferred slower pace. Preference for pace low positive relationship to information processing ability.	Panek, Barrett, Alexander, & Sterns, 1979

SECTION IV

Task Characteristics and Descriptions

A number of instruments have been developed to measure job characteristics. Turner and Lawrence (1965) labeled the six primary job characteristics as requisite task attributes. Hackman and Oldham (1975) extended the work of Turner and Lawrence in developing the Job Diagnostic Survey. More recently the Job Characteristic Inventory has been developed by Sims, Szilogyi and Keller, (1976). The Job Characteristic Inventory (JCI) was intended to be an improved version of the Job Diagnostic Survey. Brief and Aldag (1978) have recently examined the psychometric properties of the JCI. They found that the interscale correlation for subordinates and supervisors ranged around .30.

In other words, the superiors and subordinates perceptions of the jobs were not equivalent. In addition coefficient alpha for the various characteristics of variety, autonomy, feedback, dealing with others, task identity and friendship varied between .85 and .43. The study offered little support for the convergent or discriminant validity of the JCI.

Following the logic and a similar path of development as was earlier described for paper-and-pencil and behavioral inference measures of preferences for job structural attributes the present authors have developed a set of description measures. Early versions of these were paper-and-pencil; the Work Itself/Work Environment Description Questionnaire (WI/WE-D) and the Attribute Description Survey (ADS). Recently, a computerized set of job attribute descriptions measures have been developed which parallel the computerized preference measures.

Task Description and Expectations

A series of studies involving a maintenance problem-solving task was designed to investigate the effects of expectancies (Barrett, O'Connor, Alexander, Forbes, & Balascoe, 1975; O'Connor & Barrett, 1980; O'Connor, Barrett, & Alexander, 1977). The physical task was identical for all groups, but variation was introduced into the expected job structural attributes. For example, one design involved two levels of psychologically manipulated job structural attributes. In the low job structural attribute condition, participants were given a task described as low in responsibility, feedback, task identity, and learning new skills. In the high job structural attribute treatment, the individuals were told that a substantial amount of these attributes were present in the task they were being asked to perform. In both cases the task was physically the same.

The experimental manipulation of the job structural attributes was successful; subjects in the low condition rated and described the task significantly lower (97.7) than did subjects in the high condition (149.5).

In one study involving 90 subjects, there was no difference between those in the high and low conditions on the performance measures, nor in the specific measure of work satisfaction, even though the high group approached a significantly higher level of satisfaction. Individuals in the high condition expressed a significantly higher feeling of intrinsic job worth.

Empirical support for the congruence model indicates that the match between preferences for job structural attributes and expectancies resulted in significant differences in work satisfaction. Those individuals who indicated a preference for jobs low in structural attributes, and then entered a condition equivalent to these preferences, had higher satisfaction after the task than did the groups in which their preferences did not correspond to the actual task.

The research results also indicated that certain job structural attributes were particularly important in determining an individual's overall work satisfaction. For example, the job structural attribute of learning new skills correlated .43 and .49, respectively, with work satisfaction in the high and low expectancy conditions. The relationships between the other three job structural attributes and overall work satisfaction were not that strong. This result, together with evidence from the field studies, indicates that for many tasks there are certain specific job attributes which will be particularly salient for the individual performing the task.

Results from a laboratory simulation of a maintenance trouble-shooting task indicated that expectancies moderated the relationship between intellectual ability and satisfaction. There was a positive relationship between intellectual ability and the productivity of participants in both the high and low job structural attribute conditions. This finding was expected and could be predicted from empirical evidence on the relationship between ability levels and performance. However, a different pattern emerged in the relationship between ability levels and work satisfaction. For the subjects in the high expectancy condition, there was a negative correlation, -.37, between intellectual ability and work satisfaction. This indicated that the individuals with the most ability to perform the task were also those who received the least satisfaction from it. This would be a Type 2 organization (Figure 2) and is similar to the findings of the monitoring studies. The results were somewhat different for the low expectancy condition in that there was no relationship between the ability measures and work satisfaction. This could be identified as a Type 3 organization (Figure 2) since the selection system was positively related to work performance, but not related to work satisfaction. In each case, the

physical task actually performed by the participants was the same for both the high and low groups.

These results indicate that the complexity of the relationship between variables must not be minimized and must be included in job design and selection programs which attempt to maximize both performance and work satisfaction in an organization.

Changing the Task

In a laboratory simulation of monitoring tasks subjects completed two tasks which involved different levels of complexity and responsibility (Barrett, Forbes, O'Connor, & Alexander, 1980). In the low complexity condition, subjects were required to detect the presence and possible inward movement of only one signal. In the high level of complexity, the subjects were required to monitor three different types of signals with three different types of movements.

Different levels of responsibility or individual accountability were created by changing the instructions given the subjects. A low level of accountability was created by informing each group of subjects that they were all monitoring the same area; that it was only necessary for any one subject to detect a signal; and that only group performance measures would be recorded, thus precluding individual feedback. A high level of accountability was created by informing subjects that they were solely responsible for their own individual areas; that the system would operate properly only if all signals were detected; that all their responses would be recorded and that they would be given individual feedback at the end of the session.

Results from the laboratory investigation support the success of the task manipultions with the more demanding task being perceived as involving greater complexity ($t = 2.07$, $p < .05$) and responsibility ($t = 2.21$, $p < .05$). In addition, subjects working on the more demanding task made more errors

(t = 7.63, p < .001) than did their counterparts working on the simple task. Average satisfaction levels for both jobs were low and the difference across conditions was non-significant (simple task, $\bar{X}$ = 17.31, demanding task, $\bar{X}$ = 16.03). Furthermore, performance and satisfaction were not significantly related for either of the laboratory tasks.

The study found that abilities may be important determinants of job satisfaction. The negative relationship between the Group Embedded Figures Test and satisfaction on the less demanding task replicates the relationship found by Forbes and Barrett (1978) on a similar simple monitoring task. While the more demanding task was perceived as involving greater complexity and responsibility than the simpler task, the mean level of work satisfaction in this condition was no higher than that on the simple task. In addition, the increased difficulty of the demanding task resulted in much lower levels of performance, and instead of positive correlations between abilities and satisfaction, strong negative correlations were found.

A possible explanation for these findings may be the very high level of difficulty of the demanding task. Constantly remembering the last position and movement of three different types of signals (each with a different type of movement) was apparently too difficult for even the most able subjects (the mean error rate was 39% for this task). While more able subjects did perform better, it may be that their performance expectations were much higher than those of their less able counterparts and, therefore, they may have experienced greater frustration in their efforts to perform well on this difficult task. This frustration may have caused their greater feelings of dissatisfaction with the task.

It appears that attempts to redesign jobs should consider the level of difficulty of the jobs in relation to the abilities of the worker population.

While Forbes and Barrett (1978) found that, on a moderately difficult task, those with moderate levels of task-relevant abilities were most satisfied, the current data suggest that designing jobs which are either too easy or too difficult may result in similar problems (i.e., generally low levels of satisfaction, with the most able workers being the most dissatisfied).

These findings indicate that additional research on the relationships between abilities and job design outcomes is needed. The role of abilities in this area has been largely ignored, even though it appears that abilities (and not motivational constructs) account for most of the variance in job peformance (Dunnette, 1973) and, as shown in the current study, for much of the variance in job satisfaction.

SECTION V

Congruence Model & Job Outcomes

The congruence model postulates that there is an optimal match or congruence among abilities, preferred attributes, expectancies, and task complexity which will result in maximization of resources in terms of individual productivity, work satisfaction and organizational tenure.

Satisfaction

An important consideration of the congruence model is that varying degrees of job satisfaction are explained in terms of the discrepancy between preferred and described job structural attributes. Empirical evidence indicates that the greater the discrepancy between the preferred and described job structural attributes the less satisfaction an individual derives from the work itself.

In an earlier field study of Naval Personnel (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975) it was found that the job structural discrepancy score between preferred and described levels of variety, independence and total job structural attributes was negatively related to job satisfaction.

In the field study of Civil Service clerical personnel (Sterns, Alexander, Barrett, & Dambrot, submitted) negative relationships were found between job satisfaction as measured by the Job Descriptive Index and the degree of discrepancy between the preferred and described scales of the Work Itself/Work Environment Questionnaire as well as a negative relationship between work performance as measured by the Work Evaluation Questionnaire and degree of discrepancy between the preferred and described scale of the Work Itself/Work Environment Questionnaire. All relations were statistically significant at the .001 level with lower discrepancy scores associated with higher performance and higher job satisfaction.

In the field study of 71 blue collar auto workers it was found that work satisfaction could not be significantly predicted from a linear combination of the Yale Model's task attributes of variety, autonomy, feedback, task identity, and responsibility (Phillips, Barrett, & Rush, 1978). However, discrepancy scores on work scheduling equity and and person task congruence significantly improved the prediction of both work and overall job satisfaction. In a straight correlational analysis the degree of job congruence was significantly related to employee satisfaction. Generally speaking, satisfaction tended to be greater for employees who were describing their jobs as highly congruent with their preferences. At the same time, the cohort effects of education and seniority had very little effect on this correlation. Although work satisfaction could be predicted from salient task attributes, absenteeism bore a minimal relationship to work related factors but a significant relationship to life satisfaction (Phillips, Barrett, & Mooney, submitted).

The laboratory simulations have also found that satisfaction is a function of the congruence between preferred and described job structural attributes. In the maintenance simulation, O'Connor, Barrett and Alexander (1977) found that satisfaction with the task was significantly higher for those individuals whose preferences for job structural attributes matched their descriptions of those attributes in the maintenance task.

The monitoring simulation study completed by Forbes, Barrett, Alexander and Phillips (1976) investigated the work performance and satisfaction of four ability groups. The low ability group, as the model predicts, reported low satisfaction (14.1), as did those individuals with high ability who had correspondingly low work satisfaction scores (14.0). For the two medium ability groups work performance was equivalent. However, one medium ability group had the highest work satisfaction of all groups (45.1), while the other had the lowest of all groups (11.1). These differences in work satisfaction were a function of the discrepancy between preferred and described job structural

attributes. The low satisfaction medium ability group showed a discrepancy score nearly four times as great as that of the high satisfaction group.

This is perhaps the most dramatic example of the importance of matching not only ability levels, but also the importance of minimizing discrepancy between job preferences and actual evaluation of the job. As noted in this example, there was no difference in performance levels for medium ability individuals, but a great deal of difference in work satisfaction.

Performance, Organizational Tenure and Absenteeism

The major findings of field studies have indicated that those individuals with the most task related ability who perform well on a task derive the least satisfaction from a repetitive task and tend to leave an organization. This points to the importance of the congruence between preferred attributes and actual task characteristics.

In a field study of Civil Service clerical personnel (Sterns, Alexander, Barrett & Dambrot, submitted for publication), it was found that those individuals who's preferences for job attributes were congruent with the described attributes were rated by their superiors as being more effective in performing their jobs.

In a field study of sales personnel it was found an additive combination of motivation and ability measures improved the prediction of job performance (Barrett, Alexander, & Rush, 1977; Rush, 1978). In addition job tenure was found to significantly affect job related expectancies and valences. These results are summarized in Table 3.

Appropriate distinctions between concurrent and predictive validity designs

Concurrent validity has generally been considered an inappropriate methodology for assessing the validity of personnel selection procedures. Extant discussions of validation research cite four major criticisms of the concurrent validity paradigm. These include "missing persons", restriction of

Table 3

Congruence Between Preferred and Described Job Structural Attributes

Sample	Measures of Job Structural Attributes	Major Finding	References
Naval Personnel 46 Maintenance Personnel 23 Monitoring Personnel	APS/ADS	Higher discrepancy between preferred and described variety, independence and total job structural attribute score lower job satisfaction	Barrett, Bass, O'Connor, Alexander, Forbes & Cascio, 1975
Civil Service Personnel	WI/WE	Higher discrepancy between preferred and described lower job satisfaction and lower work performance	Sterns, Alexander, Barrett, Dambrot. (Submitted)
Blue Collar Auto Workers	WI/WE	Job congruence or low discrepancy between attribute preferences and descriptions related to job satisfaction	Phillips, Barrett, & Rush, 1978 Phillips, Barrett, & Mooney (Submitted)
Laboratory Simulation Maintenance Task	ADS/APS WI/WE	Satisfaction for the task was signficantly higher for those individuals whose preferences for job structural attributes matched their desciptions. In addition they completed more jobs and took less time per job.	O'Connor, Barrett, & Alexander, 1977
Laboratory Simulation Monitoring Tasks	WI/WE APS/ADS	Medium ability with low discrepancy between preferences and descrip- tions more satisfied with task than medium ability group with high discrepancy. Also congruence between described and preferred job structural attributes moderated ability - perform- ance relationship	Forbes, Barrett, Alexander, Phillips, 1976

range, motivational and demographic differences between present employees and job applicants, and confounding by job experience. Based on these four arguments, predictive validity has become the preferred methodology for validation research in spite of a lack of empirical support for this preference. An examination of the four major criticisms levied against concurrent validity suggests that the differences between the two designs have frequently been exaggerated and neither design is clearly nor consistently superior for assessing validity (Barrett, Phillips, & Alexander, submitted).

It has commonly been assumed that a concurrent validity study suffers from "missing persons". As a result, or so it is argued, the sample scores obtained in a concurrent design are totally unrepresentative of future applicant populations. The erroneous logic behind these assertions is readily apparent. Specifically, individuals who were not hired and those who have "failed" will be missing regardless of the design being employed unless the organization is in a position to hire and retain all potential applicants. A more thoughtful, and useful conclusion concerning the missing persons problem is that the answer to the question of the relative equivalence of predictive and concurrent validity depends <u>entirely</u> on the criterion being validated.

In reality, the missing persons problem is actually a question of restriction of range. Numerous organizational factors can influence the relative degree of restriction found in both predictors and criteria. Generally, an actual validation process begins only after some degree of self-selection has occurred, resulting in a nonrandom sample and a restriction of range on both predictors and criteria. For our purposes, the important fact is that the eventual validation sample is restricted to the same degree regardless of the validity design being used. Bemis (1968) for example, found that the mean and variances on one predictor battery were approximately equal in an

empirical comparison of predictive and concurrent validity designs. At least in this instance, neither was a less restricted sample.

An additional criticism of concurrent validity is that the present employee sample and the job candidate sample may differ on other relevant variables. Specifically, age and motivation are mentioned. Age may be critical if there is a significant interaction between age and scores on the predictor battery; but given the applicant populations typically involved in work settings, this may occur very infrequently. Typically it has been assumed that applicants will be highly motivated to do their best on experimental predictor tests since they believe that their scores will determine whether or not they are hired. In contrast, it has been assumed that this type of motivation will be lacking in present employees. One potential source of these differences is that concurrent designs must rely on voluntary participation by present employees while applicants generally constitute involuntary subjects. While laboratory studies have often noted a variety of differences between volunteer and nonvolunteer participants (e.g., Rosenthal & Rosnow, 1975; Rush, Phillips, & Panek, 1978), and there is weak evidence that applicants and employees may differ on their test taking motivation (e.g., Heron, 1956), important issues remain unanswered. Specifically, it is not known how differential motivation affects the distribution of test scores in a selection situation.

The Division 14 "Principles" state that "the effect of learning on the job on performance on these measures should be considered in evaluating the appropriateness of a concurrent validation model". If, for example, the criterion measures are taken after the two year period, learning on the job affects the job performance measures equally for the predictive or concurrent method. However, it should be noted that concurrent validity studies frequently include employees with varying degrees of job experience with the present organization.

In contrast, predictive designs often are conducted with a specified period between the collection of predictor and criterion data. Therefore, a predictive design often affords controls for some types of job experience not found in a concurrent design. Neither design however, controls for previous job experiences which might also be important influences on criterion scores. Further, a failure to control for present job experiences in a concurrent design is not an inherent weakness of the research methodology. Job experience can be controlled to the same extent in either design.

A more basic issue is the effect of learning on the job on the predictor variables. Here too, however, overgeneralizations about the effects of job experience on predictor scores are unwarranted. The type and nature of the experimental predictor battery will determine the appropriateness of a particular validity research design. Several commonly used selection techniques do not lend themselves to validation by means of a concurrent design. For example, a concurrent design may be inappropriate for validating certain work sample tests, since by definition, scores on these tests should be affected by work experiences. If however, the intent is to select new employees who possess all relevant capabilities at the time of hiring (as with many skilled trades), then the work sample test should reflect job experience. Thus in this case, a concurrent design may be appropriate.

The appropriate choice of a validity design is partially dependent on the type of predictor which is being validated. Certain predictors can logically be validated in either a concurrent or a predictive design; others cannot. The researcher must rationally assess the degree to which responses may or may not be distorted by current or perspective employees.

Certainly the critical nature of demonstrating validity deserves a more systematic approach than has been employed in the past. We suggest that a

beginning would be to evaluate in detail the specific nature of any particular validation effort rather than continuing to rely on the face valid superiority of the predictive validity paradigm.

SECTION VI

Implications for Improved Selection, Classification, and Personnel Utilization

Organizations have a choice when selecting and classifying individuals as to whether or not they will optimize only job performance or also take into consideration job satisfaction and expected tenure on the job.

Undoubtedly organizations are often not aware that their selection or classification procedures might actually be dysfunctional in a sense of selecting individuals who have the lowest probability of being satisfied with the work and would not be expected to have long tenure on the job.

The basic issue is how does an organization optimize a selection system to take into account diverse criteria such as job performance, work satisfaction, and tenure. We can summarize a number of approaches.

First, use a selection instrument which relates to all three criteria in a positive direction instead of a test which relates in a negative fashion to one of the criteria. In our series of studies and in our review of the literature, it was evident that organizations often do have a choice among predictors such that one predictor may relate positively to job performance but negatively to work satisfaction and tenure while a second predictor will relate positively to all three criteria.

Second, the expectations concerning the job structural attributes of the task can be manipulated to make them more congruent with the task demands. The expectations can have an effect and interact with the selection system in determining work satisfaction.

Third, the physical nature of the task can be changed to make it either simpler or more complex. This can change the relationship between the criteria and predictor. This solution is perhaps the most difficult to implement since often the physical nature of the task is not amenable to change.

Fourth, individuals can be selected based, not only on ability dimensions, but also on job structural attribute preferences. This requires a match between the two variables in order to optimize the criteria. This approach is one which we believe holds the most promise for organizations.

It is based on a number of assumptions which have been tested in a series of research studies during this project period. The main assumption is that there are individual attributes which we have labeled job structural attribute preferences which are a stable characteristic of individuals. For example, there are individual preferences for pace of work which can be reliably measured. In addition, these individual preferences for pace have expected differences among specified groups. Our second assumption is that while there may be weak relationships between traditional measures of ability and certain preferences such as preferred pace, in general these are independent dimensions. Our research has supported this proposition. Third, it is assumed that individuals can be found with the requisite amount of ability and the preference attribute in a combination which will allow for both increased job performance and satisfaction. Quite often the optimum combination might be high ability with low preference for certain specified job structural attribute preferences.

Our preliminary results indicate that computerized information processing measures and computerized preferences in combination can improve personnel utilization.

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